Slide 1: Using Mobile ICT To Enable Social Support in Chronic Care Management

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Slide 2: Presentation Overview

- Collaborative care and social support
- Web 2.0 concepts
- "Diabetes Social Support" Study
- Organizing principles: issues, solutions, and user feedback
    - Technology
    - Social support
- Potential future directions for research and implementation

Slide 3: Chronic Care Model Framework

- Coordinate efforts of individuals to optimize chronic illness care and outcomes
    - Individuals include patient, community (friends, family), providers
    - Integration and coordination can be within or between groups (e.g., among patients, between a patient and friends/family)
- Collaborative care and decisionmaking
- Shared clinical goals
- Productive interactions
    - Interactions can be directed or reciprocal
    - Interactions can be between patients and peers

Slide 4: Web 2.0 Framework

- Technology-mediated social participation
- Social dimension(s) that define participation
    - Common interests or goals
    - "Connectedness" as a motivator for participation
    - Interactions intended to "add value" to participants
- Infrastructure (technology) to enable and mobilize participation
    - Technology defines the dimensions of the social network
    - Directed or reciprocal electronic interactions can occur within the virtual community

Slide 5: The Challenge

Source: Eisenberg Center Conference Series 2010, The Prospect for Web 2.0 Technologies for Engagement, Communication and Dissemination in the Era of Patient-Centered Outcomes Research, Effective Health Care Program Web site (http://www.effectivehealthcare.ahrq.gov/index.cfm)

- Chronic diseases are prevalent, costly, and require extensive self-monitoring and self-management outside the traditional clinic setting
- Excellent evidence for the importance of self-monitoring and self-management in chronic diseases
- Excellent evidence for the importance of social support in motivating adherence to self-management
- Can Web 2.0 concepts be applied in a clinical setting to motivate instrumental and emotional social support in chronic care management?

Slide 6: Diabetes Social Support Pilot Study (1)

- Objective: To assess the usability of mobile ICT and value added of peer instrumental and emotional social support for SMBG
- Study Population: 15 adults with type 2 diabetes and baseline HbA_{1c} >8.0% and their self-selected supporters (6 pairs from Kaiser Permanente Georgia and 9 pairs from Oakhurst Medical Center)
    - Average age of the diabetes patients was 49.3 years; 67.7% were female; 86.7% were African American.
- Study Protocol: An enrollment session, 3-month trial period, and a disenrollment session

Slide 7: Diabetes Social Support Pilot Study (2)

- Enabling technology:
    - Glucometer
    - Transmitter requiring a phone connection
    - Data center (receiving, logging, transmission services)
    - Cell phones (diabetes patient and paired supporter) with text message capability
- Social network: Dyad (patient–supporter)
- How to pull it all together into a model that will effectively direct attitudes and behaviors in the intended direction (improve SMBG frequency and results)?

Slide 8: Which Technology Components To Use? (1)

- Considerations:
    - Access and availability
    - Familiarity and ease of use
    - Relevant, tested functionality
- Decisions:
    - Cell phones:
        - Nearly universal availability as primary or secondary phone service

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- Access nearly unrestricted in terms of space or time
- Most users familiar with basic dialing and texting capabilities

Slide 9: Which Technology Components To Use? (2)

- Decisions:
  - GlucoMON® and Diabetech LLC
    - Transmitter compatible with most commonly used glucometers (compatible one provided if not)
    - Data bank to receive SMBG data
    - Existing programs to transmit SMBG results to: 1) primary care physicians (PCP) of adult diabetes patients, 2) parents of juveniles with type diabetes
  - Redirect transmission to PCP and/or parent to peer supporter to establish a simple peer-support network

Slide 10: Which Technology Components To Use? (3)

- Results
  - Usability (www.usability.gov)
  - "Well, I thought it was great and easy…. [Y]ou just plug it in and it gives you the information and the information was sent to both of our phones."
  - 11 of 15 (73%) of diabetes participants had connected components and completed one transmission within 5 days of enrollment
  - Those who connected shortly after the enrollment session tended to be frequent users
  - Followup and assistance was required after the enrollment session

Slide 11: How To Organize Communication: Message Delivery (1)

- Considerations:
  - Technological constraints
  - Participant financial burden
  - Participant psychological burden
  - System complexity and cost
- Decisions:
  - Text messages limited to 128 characters
  - Limit frequency of text messaging to patient and supporter participants to less than SMBG frequency
  - Many basic cell phone plans support text messaging but have a service charge ($0.20–$0.25) per message

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Slide 12: How To Organize Communication: Message Delivery (2)

- Decisions:
    - Text messages would be limited to every 5 days and to a random time between 9 am and 9 pm
        - Frequency of text messages (5-day cycle) was a compromise between goal of minimizing participant burden and message content (which focused on trends and not details of SMBG)
        - Randomness was intended to mitigate consequences of message "predictability"
- Results:
    - Participants found the frequency to be "about right" and neither annoying nor distracting

Slide 13: How To Organize Communication: Message Content (1)

- Considerations:
    - Relevance to application goals ("meaningful")
    - Structured (system—participant) versus unstructured (participant—participant) communication
    - Consistent with evidence or consensus based clinical practice
        - AD Guidelines
        - KPGA/OMC Clinical Practice Guidelines
    - Compliance with HIPAA requirements and IRB concerns
- Decisions:
    - Text-message content would acknowledge SMBG practice: frequency and results

Slide 14: How To Organize Communication: Message Content (2)

- Decisions:
    - Text-message content would summarize patterns/trends in recent SMBG history but avoid referencing actual SMBG results

2 × 2 matrix of messages
Parallel messages for diabetes patient and supporter:
Patient: "You are monitoring your diabetes regularly. Your blood sugar levels remain high. You might contact your primary care team."
Supporter: "I see that you are monitoring your blood sugar every day, but your blood sugar levels seem high. How can I help you?"

Slide 15: How To Organize Communication: Message Content (3)

- Decisions:

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    - Supporters would be instructed and encouraged to follow OARS motivational coaching techniques in their interactions with diabetes patients
    - Diabetes patients might benefit in self-assessments by using OARS motivational coaching techniques
- Results:
    - Text messages to supporters prompted interactions that might not otherwise have occurred
    - "It got my whole family involved. My granddaughter would see the latest text message and call me to say, 'Granny, your blood sugar was high'."

Slide 16: How To Organize Communication: Message Content (4)

- Results:
    - Some mixed reactions to message content that we assumed would be motivational:
        - "[The messages] normally started out positive and then show that you care and say 'good job.' A couple of times I said, 'I know I didn't do well this week' but … you praise[d] me for what I did do."
    - Whether brief instruction in OARS techniques of motivational coaching added value was questionable:
        - "We are so comfortable with each other…we've known each other for so long…we're like sisters. She was very comfortable talking to me, and I was very comfortable talking to her."

Slide 17: How To Organize the Community (1)

- Considerations:
    - Application goal — MOTIVATE SMBG by mobilizing emotional and instrumental support
    - Which individuals enter the network can have a significant positive or negative effect on health behaviors and attitudes
- Entry rules
    - Random
    - Nominated, by whom (participant, moderator)
- Exit rules

Slide 18: How To Organize the Community (2)

- Decisions:
    - Self-selected peer (close friend or family member) whose support and opinion was valued by the diabetes patient
    - Unmoderated interactions between diabetes patient and supporter

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        - Exception: Review of specified high and low SMBG values to trigger research team interventions
- Results:
    - Greater attention to importance of SMBG by diabetes patients
        - "I checked [my blood sugars] more because I knew that someone was holding me accountable and I knew you were monitoring it…sending it in…I wanted to finish what I started and make sure I am giving myself an opportunity to improve my blood sugar and my husband was helping too."

Slide 19: How To Organize the Community (3)

- Results:
    - Improved emotional and instrumental social support:
        - "I wasn't much of a supporter until we got this device. I was out of sight. [I]t was avoidance on my part…. Since we got this device…I've learned more about her diabetic condition and her daily needs…I'm understanding it more…because this became a focal point for all of us."
        - "It was really good because I really didn't know what my mother was going through or like different food that she was eating, because I don't have diabetes and I am used to eating whatever."

Slide 20: Other Web 2.0 Pilot Studies Under Consideration

- Diabetes Prevention Program via multimedia interactive Web site
    - Structured, instructional sessions on lifestyle (progress monitored by diabetes educator)
    - E-mailing diabetes educator
    - Moderated topical discussions by diabetes educator
- Postpartum Weight Management via Webinar format
    - Virtual group visits with moderated discussions by nurse, nutritionist
- Diabetes Social Support randomized controlled trial
    - Three study groups (1 control + 2 intervention)
    - Intervention study groups with and without peer supporters

Slide 21: Summary (1)

- Integrating mobile ICT into chronic disease management by using Web 2.0 concepts does appear to be a means for engaging adults in effective self-management strategies and for disseminating those strategies into the community
- Our pilot study identified a number of issues that must be considered and resolved in developing such applications

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- Moderating role of technology for engagement, communication, and dissemination of effective practices by mobilizing social support for self-management of chronic disease

Slide 22: Summary (2)

- Accessible technology already exists that can be integrated into systems to engage patients in chronic disease self-management, but:
  - The costs and effort to integrate these components into a specific application can be substantial
  - The low entry and maintenance costs for participants are not necessarily low from the delivery-system perspective
  - We often believe that these innovative technologies may solve the challenges of addressing the needs of patients who consistently do not adhere to treatment
  - Delivery systems need to consider if ICT or Web 2.0 interventions will be effective for patients who are nonadherent to treatment or will merely be a substitute for otherwise effective traditional strategies for patients who are routinely adherent

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